Mammals

Arctic Shrew (*Sorex arcticus*)

State Rank: S1S3
Global Rank: G5

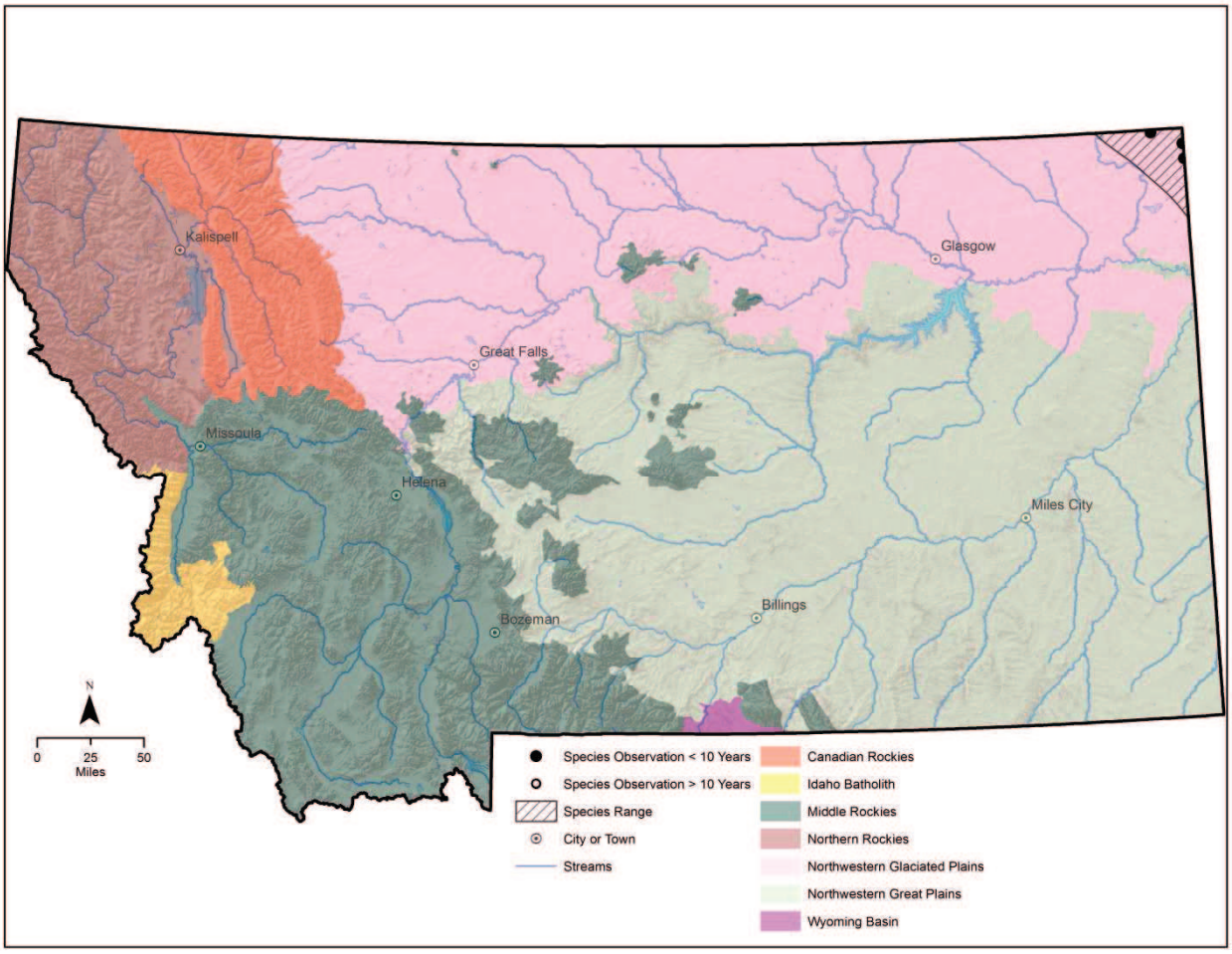

Figure 56. Montana range and observations of the arctic shrew

Habitat

Little is known about habitat requirements of the arctic shrew in Montana. All individuals captured were in wet meadows adjacent to marshes or in the sandy flats of creek floodplains (Foresman 2012).

Management

No management needs have been identified nor have any measures been enacted for the conservation of arctic shrew in Montana. Nevertheless, wetland drainage or alteration has the potential to negatively impact local populations. Additional surveys for arctic shrew can provide the basis for development of conservation protocols by determining its full distribution in Montana, the array of habitats in which it occurs, its relative abundance in different habitats, and, if properly designed, an idea of how different habitat disturbances affect this shrew at the margin of its global range.

Management Plan
None.

Arctic Shrew Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Data poor		Target species for survey and inventory
Conversion of native habitat to cropland agriculture	Conversion of native habitat to cropland agriculture	Protect habitat that is at highest risk of conversion to cropland through the possible use of easements acquisition Work with landowners and land management agencies to limit activities that may be detrimental to this species
Oil and gas development	Oil and gas development	Follow recommendations in FWP's *Fish and Wildlife Recommendations for Oil and Gas Development in Montana* (FWP In prep)
Wetland degradation or loss	Wetland degradation or loss	Work with landowners and land management agencies to limit activities that may be detrimental to this species

Additional Citations

Foresman, K. R. 2012. Mammals of Montana. Mountain Press Publishing Company. Missoula, Montana.

Montana Fish, Wildlife & Parks. In Prep. Fish and Wildlife Recommendations for Oil and Gas Development in Montana.

Bison (*Bos bison*)

State Rank: S2
Global Rank: G4

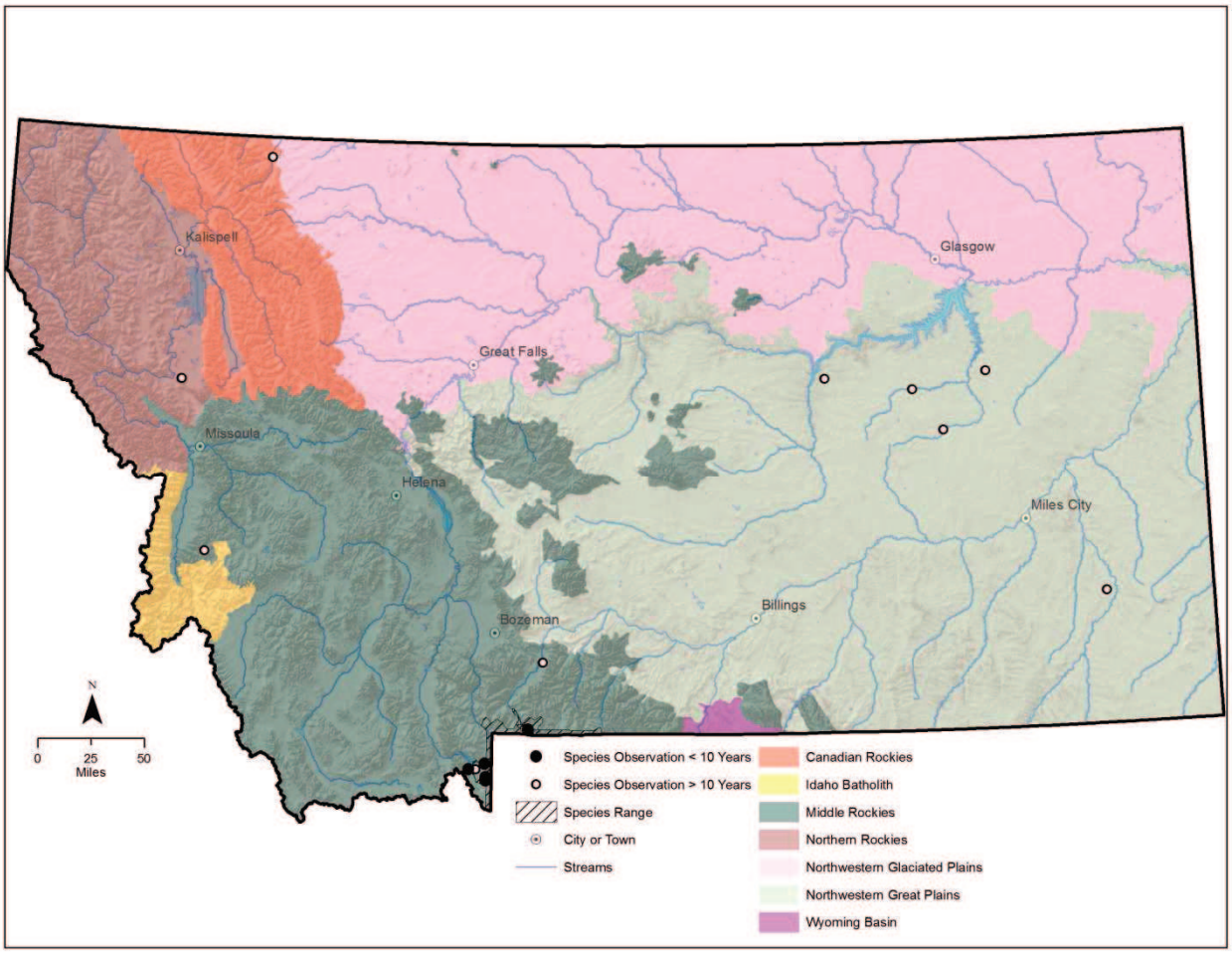

Figure 57. Montana range and observations of bison

Habitat

Because of restrictions, currently occupied habitat does not reflect the full natural range for bison. Throughout their range, bison inhabit woodlands and open plains and grasslands. Woodlands and openings in boreal forests, meadows, and river valleys are used in the northern parts of their range. Like other large grazers, they are attracted to burn areas the next growing season (Shaw and Carter 1990). During the growing season at the Konza Prairie in northeastern Kansas, they preferred areas that had been burned in spring. Summer grazing was concentrated in a large watershed area (195 to 295 acres) dominated by warm-season, perennial C4 grasses. In fall and winter they grazed both burned and unburned watersheds more uniformly, but grazed most intensively in areas with large stands of cool-season, C3 grasses (Vinton et al. 1993).

Management

Bison are classified as "domestic livestock" or a "game animal" depending on whether they are found in the wild or in privately held herds (Adams and Dood 2011). Their classification also dictates which state agency has management authority, Department of Livestock or FWP.

Management of free-ranging bison in Montana has been controversial. The presence of brucellosis in these animals and their migration out of YNP into adjacent public and private lands has led to conflicts between private landowners, citizens, public administrative agencies, and public land management agencies. Free-ranging herds in Montana are currently managed under the Interagency Bison Management Plan (National Park Service 2000).

The current distribution of the only wild herd of bison in Montana is the YNP herd. Management potential of this herd is limited to several very small areas outside of YNP where they are tolerated. This bison herd is designated as "species in need of disease control" under the Interagency Bison Management Plan (National Park Service 2000). Hunting is allowed on this herd when individuals leave the park and enter Montana.

The current YNP bison controversy needs to be addressed in a manner to reduce conflict while providing adequate habitat and management for long term persistence of this herd.

Management Plan
Montana Department of Livestock and Montana Fish, Wildlife & Parks. 2000. Interagency bison management plan. 70 pp.

National Park Service. 2000. Bison Management for the State of Montana and Yellowstone National Park. Final Environmental Impact Statement for the Interagency Bison Management Plan for the State of Montana and Yellowstone National Park. Vol. I. August 2000.

Bison Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Bison genome has been eroded by unnatural management practices and introgression with domestic cattle genes	Bison genome has been eroded by unnatural management practices and introgression with domestic cattle genes	Preserve wild bison genome through herd expansion and restoration of bison as wildlife in North America
Disease (brucellosis)	Disease risk in YNP	Follow FWP's brucellosis plan and protocols Continue development of working relationships with landowners and other constituents

Current Impacts	Future Threats	Conservation Actions
Existing genetically intact herds are not free ranging with the exception of the YNP herd which technically is limited in range outside of Park borders	Existing genetically intact herds are not free ranging with the exception of the YNP herd which technically is limited in range outside of Park borders	Establish disease-free bison populations as wildlife in suitable grassland habitats outside YNP where they can function ecologically and operate as keystone species to restore grassland systems Create populations of wild bison that can be harvested and provide economic and social benefits to MT Work with landowners, other agencies, and non-governmental organizations to encourage bison tolerance outside of YNP

Additional Citations

Adams, S.M. and A.R. Dood. 2011 Background Information on Issues of Concern for Montana: Plains Bison Ecology, Management, and Conservation. Montana Fish Wildlife & Parks, Bozeman, Montana.

National Park Service. 2000. Bison Management for the State of Montana and Yellowstone National Park. Final Environmental Impact Statement for the Interagency Bison Management Plan for the State of Montana and Yellowstone National Park. Vol. I. August 2000.

Shaw, J. A., and T. S. Carter. 1990. Bison movements in relation to fire and seasonality. Wildlife Society Bulletin 18:426–430.

Vinton, M. A., D. C. Hartnett, E. J. Finck, and J. M. Briggs. 1993. Interactive effects of fire, bison (*Bison bison*) grazing and plant community composition in tallgrass prairie. American Midland Naturalist 129:10–18.

Black-footed Ferret (*Mustela nigripes*)

State Rank: S1
Global Rank: G1

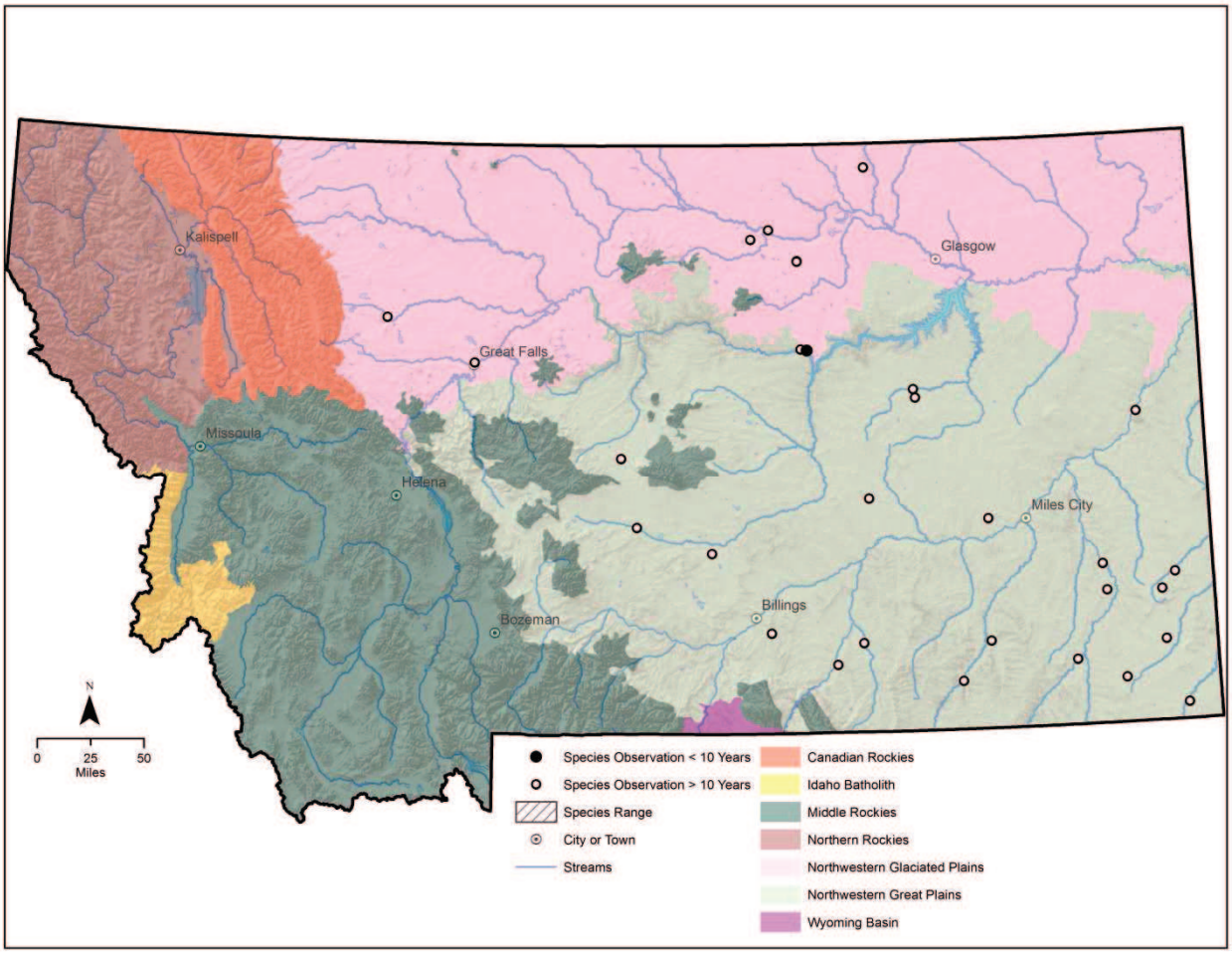

Figure 58. Montana observations of the black-footed ferret

Habitat

Black-footed ferrets are intimately tied to prairie dogs (*Cynomys* spp.) throughout their range and have only been found in association with prairie dogs. They are therefore limited to the same open habitat used by prairie dogs: grasslands, steppe, and shrub-steppe. Black-footed ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter. Only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population of black-footed ferrets. It has been estimated that about 100 to 150 acres of prairie dog colony is needed to support one ferret, and females with litters have never been found on colonies smaller than 120 acres (Miller et al. 1996). Ferrets scent-mark to maintain spatial separation (Richardson 1986).

Management

Black-footed ferrets have been extirpated from most of their former large range largely as a result of loss of habitat due to prairie dog control programs and have been listed as endangered since 1967. Canine distemper, in conjunction with captures for captive breeding, resulted in extirpation of the last known wild population near Meeteetse, Wyoming, by early 1987. See

Miller et al. (1996) for more information on the discovery of the Meeteetse ferrets and subsequent distemper-caused decline and captive breeding decisions that occurred in 1985. Currently the only known surviving populations are the result of captive-bred ferret reintroductions. Reintroductions have occurred in Montana on federal and tribal land since 1994 with varying success. Predation by coyotes and badgers and the loss of prairie dogs to sylvatic plague appear to be the primary failures of reintroduction efforts. Some wild reproduction has occurred, but no self-sustaining populations have been established in Montana.

In Montana, the goal is to reestablish 2 viable populations with a minimum of 50 breeding adults in each (FWP 2013). Nationwide, the objective is to increase the captive population to 250 breeding adults and to establish a wild pre-breeding population of 1,500 adults in 10 or more locations by 2020 (Black-footed Ferret Recovery Implementation Team 2013). A Programmatic Safe Harbor Agreement with 12 states was completed in October 2013. This is an important step to recover this species.

Management Plans

Anderson, M. E. et al. 1978. Black-footed ferret recovery plan. U.S. Fish and Wildlife Service Black-footed Ferret Recovery Team. 150 pp.

Bureau of Land Management. 1979. Habitat management plan prairie dog ecotypes. BLM, Montana State Office. Wildlife Habitat Area MT-02-06-07-S1. 61 pp.

Christopherson, D., R. Stoneberg, R. Matchett, D. Biggins, J. Grensten, A. Dood, B. Haglan. 1994. Black-footed ferret reintroduction in Montana: project description and 1994 protocol. 31 pp plus appendix.

Montana Fish, Wildlife & Parks. 1992. North-central Montana black-footed ferret reintroduction and management plan. Prepared by North Central Montana Working Group. 59 pp.

U.S. Fish and Wildlife Service. 1988. Black-footed ferret recovery plan. Denver, Colorado. 154 pp.

U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants: establishment of a nonessential experimental population of black-footed ferrets in north-central Montana; final rule. Federal Register 59:42696-42715.

U.S. Fish and Wildlife Service. 2013. DRAFT Recovery plan for the black-footed ferret (*Mustela nigripes*). Denver, Colorado. 130 pp.

Black-footed Ferret Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Disease, such as canine distemper	Disease, such as canine distemper	Continue monitoring diseases that impacts the health of populations
Failed success of reintroduction efforts	Failed success of reintroduction efforts	Continue supporting future reintroduction efforts based on the adaptive management paradigm
Lack of prey base due to declining prairie dog colonies	Lack of prey base due to declining prairie dog colonies	Use plague vaccine, if proven effective, on prairie dog towns that ferrets use or may be translocated to Work through cooperative agreements with private landowners and land management agencies to manage for healthy populations of prairie dogs
Reduction of habitat	Reduction of habitat	Conduct research to validate critical habitat needs of black-footed ferrets Continue to develop, refine, and implement financial incentives for landowners to maintain prairie dogs Support strategic conservation easements by conservation organizations and public agencies to enhance important habitat Work to develop information campaign to inform landowners and public concerning the need to maintain healthy habitats for black-footed ferrets
	Climate change	Continue to evaluate current climate science models and recommended actions Monitor habitat changes and address climate impacts through adaptive management as necessary

Additional Citations

Black-footed Ferret Recovery Implementation Team. 2013. http://www.blackfootedferret.org/recovery-plan-goals

Miller, B., R. P. Reading, and S. Forrest. 1996. Prairie Night. Smithsonian Institute Press. Washington DC. 320 pp.

Montana Fish, Wildlife & Parks. 2013. Black-footed ferret species of interest page. http://fwp.mt.gov/fishAndWildlife/species/endangered/ferret/default.html

Richardson, L. 1986. On the track of the last black-footed ferrets. Nat. Hist. 95(2):69–77.

Dwarf Shrew (*Sorex nanus*)

State Rank: S2S3
Global Rank: G4

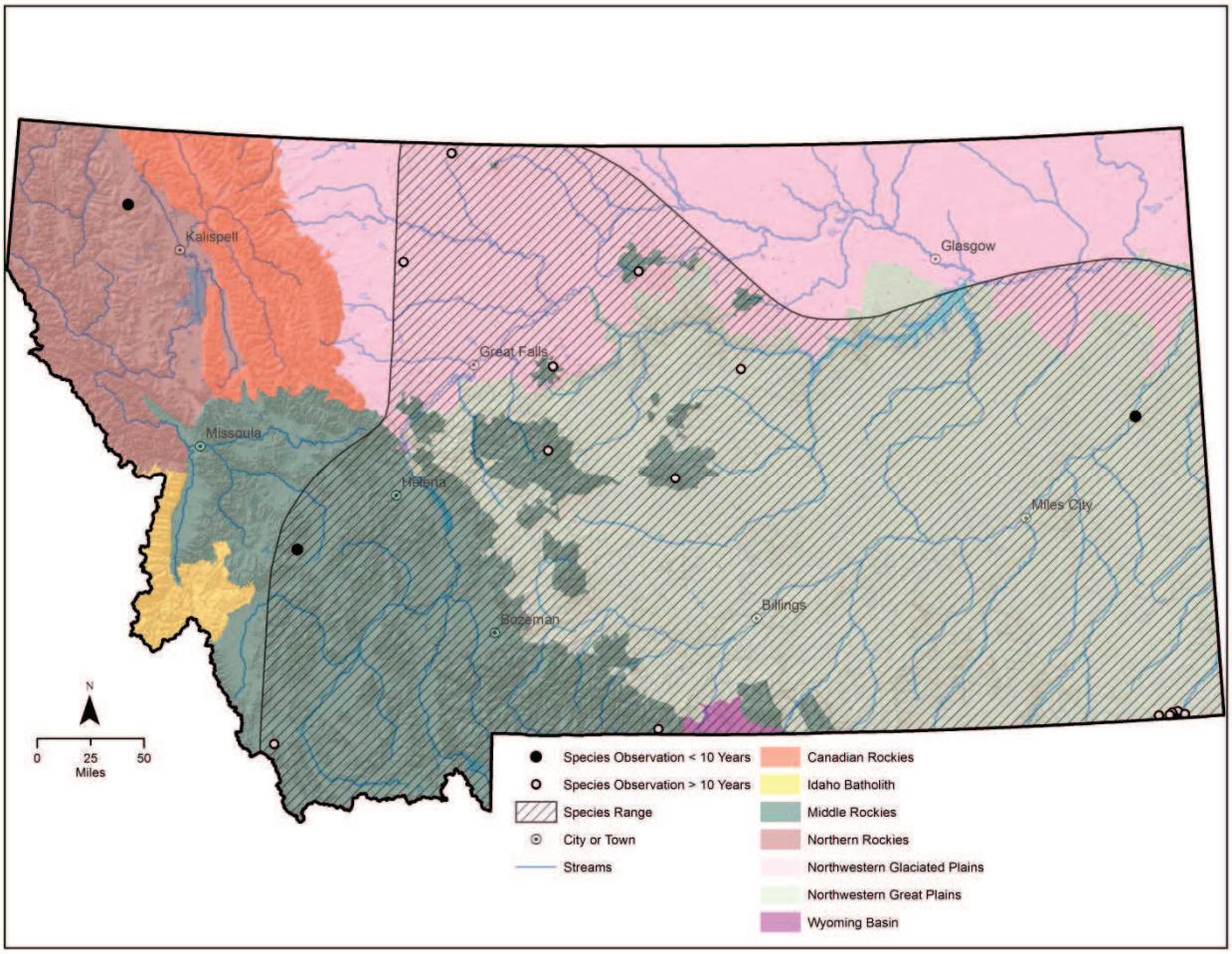

Figure 59. Montana range and observations of the dwarf shrew

Habitat

In general, the dwarf shrew is found in a variety of habitats, including rocky areas and meadows in alpine tundra and subalpine coniferous forest (spruce-fir), rocky slopes and meadows in lower-elevation forest (e.g., ponderosa pine, aspen, Douglas-fir) with a mixed shrub component, sedge marsh, subalpine meadow, arid sagebrush slopes, arid shortgrass prairie, dry stubble fields, and pinyon-juniper woodland (Hoffmann and Owen 1980, Berna 1990, Kirkland et al. 1997, Rickart and Heaney 2001, Hafner and Stahlecker 2002).

Habitats where dwarf shrews have been documented in Montana are similar in variety to those occupied elsewhere in the global range. Many have been taken in rocky locations in alpine terrain and subalpine talus (0.75 to 4 inches diameter) bordered by spruce-fir, lodgepole pine, or Douglas-fir and aspen; lesser numbers have been captured in montane grassland, sagebrush-grassland with 22% bare ground, and prairie riparian habitat dominated by green ash, rose, and timothy (Hoffmann and Taber 1960, Pattie and Verbeek 1967, Hoffmann et al. 1969, Thompson 1977, MacCracken 1985). Dwarf shrews appear to be adapted to many different habitat conditions (Foresman 2012).

Management

No management measures have been enacted for dwarf shrew in Montana. However, alteration or removal of grassland and sagebrush through fire, herbicides, or mechanical methods, may impact local lower-elevation populations. Measures taken to protect a diversity of size and cover classes of grassland and sagebrush will likely contribute to the conservation of dwarf shrew. Reclamation/restoration of native prairie appears to provide some measure of effective mitigation for strip-mining activity in prairie regions (Kirkland et al. 1997), but this needs additional study. Surveys for dwarf shrew can provide the basis for development of conservation protocols by determining its full distribution in Montana, the array of habitats in which it occurs, its relative abundance in different habitats, and, if properly designed, an idea of how different habitat disturbances affect this rare shrew.

Management Plan

None.

Dwarf Shrew Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Data poor		Target species for survey and inventory

Additional Citations

Berna, H. J. 1990. Observations on the dwarf shrew (*Sorex nanus*) in northern Arizona. Great Basin Nat. 50: 161-165.

Foresman, K. R. 2012. Mammals of Montana. Mountain Press Publishing Company. Missoula, Montana.

Hafner, D. J., and D. W. Stahlecker. 2002. Distribution of Merriam's Shrew (*Sorex merriami*) and the Dwarf Shrew (*Sorex nanus*), and new records for New Mexico. Southwestern Naturalist 47:134-137.

Hoffmann, R. S. and J. G. Owen. 1980. *Sorex tenellus* and *Sorex nanus*. Mamm. Species 131:1-4.

Hoffmann, R. S. and R. D. Taber. 1960. Notes on Sorex in the northern Rocky Mountain alpine zone. J. Mammal. 41(2): 230-234.

Hoffmann, R. S., P. L. Wright, and F. E. Newby. 1969. Distribution of some mammals in Montana. I. Mammals other than bats. J. Mammal. 50(3): 579-604.

Kirkland, G. L., Jr., R. R. Parmenter, and R. E. Skoog. 1997. A five-species assemblage of shrews from the sagebrush-steppe of Wyoming. Journal of Mammalogy 78:83-89.

MacCracken, J. G., D. W. Uresk, and R. M. Hansen. 1985. Habitat used by shrews in southeastern Montana. Northwest Science 59(1):24-27.

Pattie, D. L. and N. A. M. Verbeek. 1967. Alpine mammals of the Beartooth Plateau. Northwest Sci. 41(3): 110-117.

Rickart, E. A., and L. R. Heaney. 2001. Shrews of the La Sal Mountains, southeastern Utah. Western North American Naturalist 61:103-108.

Thompson, L.S. 1977. Dwarf shrew in north-central Montana. J. Mammal. 58:248-250.

Grizzly Bear (*Ursus arctos*)

State Rank: S2S3
Global Rank: G4

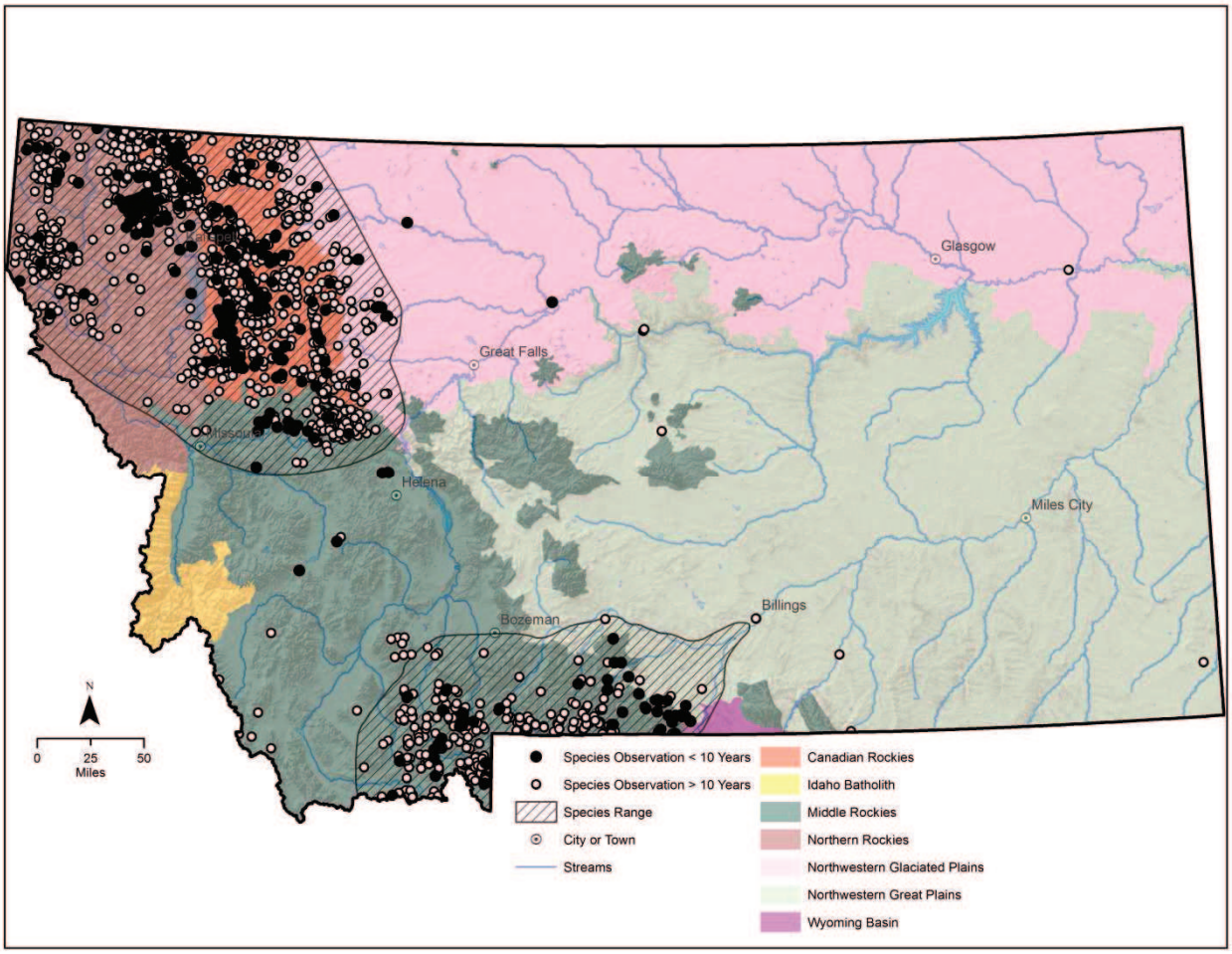

Figure 60. Montana range and observations of the grizzly bear

Habitat

In Montana, grizzlies primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, side-hill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations, and individuals (Servheen 1983; Craighead et al. 1982; Aune et al. 1984). Historically, the grizzly also was present on the plains occurring throughout most of eastern Montana.

Management

On July 28th, 1975, the grizzly bear was designated as threatened in lower 48 states under the ESA. Currently populations in the Cabinet/Yaak, Northern Continental Divide and Greater Yellowstone recovery areas are listed as threatened. The Bitterroot Recovery Zone in the Bitterroot Mountains of Montana and Idaho was designated in anticipation of reintroduction of grizzly bears where they would be classified as experimental nonessential. This reintroduction never took place, but in 2007 a naturally colonizing grizzly bear was killed in the Idaho portion of this recovery area.

In 2007, USFWS announced that the Yellowstone Distinct Population Segment of grizzly bears was a recovered population no longer meeting the ESA's definition of threatened (Federal Register 2007). In 2009 the Yellowstone Distinct Population Segment was relisted as threatened as a result of a U.S. District ruling that stated declines in whitebark pine and inadequate conservation plans still threaten the species. This ruling has been upheld by the U.S. 9th Circuit Court of Appeals. USFWS completed a 5-year review of the status of grizzly bears in August of 2011. There are numerous policies, e.g., MCA 12.9.103 that outline guidelines for FWP to promote the conservation and responsive management grizzly bears in Montana. Regional specific management plans include the Grizzly Bear Management Plan for Southwestern Montana (FWP 2002; 2013 plan underway) and the Grizzly Bear Management Plan for Western Montana (Dood et al. 2006), along with various tribal, National Forest, and National Park plans and policies. Most of these management plans are centered on 3 major themes: management of habitat to ensure grizzly bears have large expanses of suitable interconnected lands in which to exist, management of grizzly bear/human interactions that can result in death of the bears involved, and monitoring to determine population size and trends. Consult the management plans listed below for specifics on grizzly bear management.

Management Plans

Dood, A. R., S. J. Atkinson, and V. J. Boccadori. 2006. Grizzly Bear Management Plan for Western Montana: final programmatic environmental impact statement 2006-2016. Montana Department of Fish, Wildlife and Parks, Helena, Montana. 163 pp.

Interagency Conservation Strategy Team. 2007. Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area. 86 pp.

Interagency Conservation Strategy Team. *In prep*. Final Conservation Strategy for the Grizzly Bear in the Northern Continental Divide Ecosystem.

Montana Fish, Wildlife & Parks. 2001. Conservation Plan for Grizzly Bears in Montana. Pursuant to Section 6(C)(1) of the Endangered Species Act and Montana Fish, Wildlife & Parks Endangered Wildlife Program E-6. Helena, Montana.

Montana Fish, Wildlife & Parks. 2002. Grizzly Bear Management Plan for Southwestern Montana 2002–2012.

Servheen, C. 1993. Grizzly bear recovery plan. Unpublished report to the U.S. Fish and Wildlife Service. University of Montana, Missoula, Montana. 181 pp.

Shaffer, M. 1992. Keeping the grizzly bear in the American West: an alternative recovery plan. The Wilderness Society, Washington, DC.

U.S. Fish and Wildlife Service. 1982. Grizzly bear recovery plan. Unpublished report prepared in cooperation with recovery team leader Don L. Brown of the Montana Department of Fish, Wildlife & Parks. 195 pp.

Grizzly Bear Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Genetic fragmentation among Montana populations	Genetic fragmentation among Montana populations	Ongoing research projects, including genetic analysis projects
Habitat loss, degradation, and fragmentation	Habitat loss, degradation, and fragmentation	Encourage and support opportunities such as land purchases or conservation easements to protect important grizzly habitats Keep road density at or below current levels to meet management goals outlined for grizzly recovery in western and southwest Montana
Human-bear and bear-livestock interactions	Human-bear and bear-livestock interactions	Continue and expand "living with bears" educational efforts in areas currently occupied or likely to be reoccupied by grizzly bears Continued interagency management efforts Maintain a grizzly bear education program to landowners that may have prairie grassland habitat that may harbor grizzly bears during at least portions of the year (refer to NCDE grizzly bear management plans) Managing recreational use may be needed in some areas to reduce conflicts with grizzly bears that come in to feed on berry crops Proactive management including public outreach, utilizing Montana citizens Reduce human-caused mortality, including vehicles and trains

Additional Citations

Aune, K., T. Stivers, and M. Madel. 1984. Rocky Mountain Front grizzly bear monitoring and investigation. Montana Department of Fish, Wildlife & Parks, Helena, Montana. 239 pp.

Craighead, J. J., J. Sumner, and G. Scaggs. 1982. A definitive system for analysis of grizzly bear habitat and other wilderness resources. Wildlife-Wildlands Institute Monograph 1. University of Montana, Missoula, Montana. 279 pp.

Dood, A. R., S. J. Atkinson, and V. J. Boccadori. 2006. Grizzly Bear Management Plan for Western Montana: final programmatic environmental impact statement 2006-2016. Montana Department of Fish, Wildlife and Parks, Helena, Montana. 163 pp.

Federal Register. 2007. Endangered and Threatened Wildlife and Plants; Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area. 72. Federal Register. 48. March 13, 2007. p. 11376.

Montana Fish, Wildlife & Parks. 2002. Grizzly Bear Management Plan for Southwestern Montana 2002–2012.

Servheen, C. 1983. Grizzly bear food habits, movements and habitat selection in the Mission Mountains, Montana. Journal of Wildlife Management 47:1026–1035.

Northern Bog Lemming (*Synaptomys borealis*) State Rank: S2
Species of Greatest Inventory Need Global Rank: G5

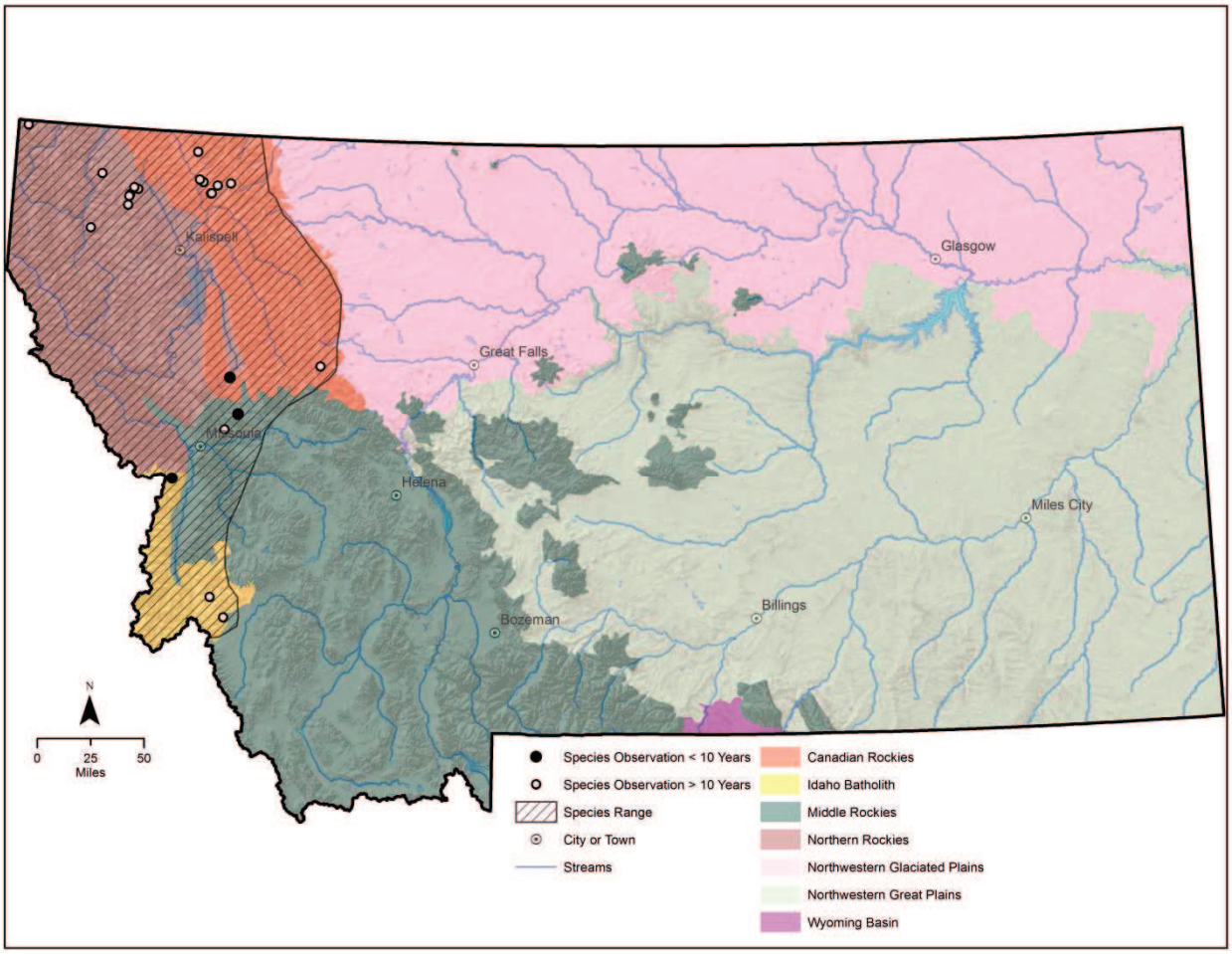

Figure 61. Montana range and observations of the northern bog lemming

Habitat

Northern bog lemmings occupy a variety of habitats throughout their range, especially near the southern edge of their global distribution. Typically, these habitats have high moisture levels and include sphagnum bogs, wet meadows, moist mixed and coniferous forests, montane sedge meadows, krummholz spruce-fir forests with dense herbaceous and mossy understory, alpine tundra, mossy streamsides, and even sagebrush slopes in the case of *S. b. artemisiae* in British Columbia (Clough and Albright 1987; West 1999; Streubel 2000). Within these habitats, they occupy surface runways and burrow systems up to 12 inches deep and can be found in small colonies with population densities that may reach 36 individuals per acre (Streubel 2000). They are active day and night throughout the year, feeding mostly on herbaceous vegetation (Foresman 2012). Young are born in nests that may be underground or on the surface in concealing vegetation. Northern bog lemmings in Montana have been found in at least 9 habitat types, including Engelmann spruce, subalpine fir, birch, willow, sedge (*Carex*), spike rush (*Eleocharis*), or combinations of the above, often occurring in wet meadows, fens, or boglike environments. Wright (1950) captured lemmings in a swampy area containing spruce trees, timothy, alder, and other moist-site plants (Wright 1950). The Upper Rattlesnake Creek specimen

was captured in a wet-sedge/bluejoint meadow near subalpine fir (Adelman 1979). Areas with extensive moss mats, primarily sphagnum, are the most likely sites to find new populations (Wright 1950; Reichel and Beckstrom 1994; Reichel and Corn 1997; Pearson 1999).

Management

No coordinated management activities have been developed or implemented for this species in Montana. Nevertheless, some populations on USFS lands are provided added protection through special management/conservation policy guidelines applied to peatlands, including the Research Natural Area designation (Chadde et al. 1998). Research Natural Area designation typically prohibits manipulative management, such as timber harvest and livestock grazing. The Clean Water Act and state water quality standards protect water quality of these peatlands. Protection guidelines (Reichel and Corn 1997) should be applied to all sites where northern bog lemmings are known to occur, as well as potential peatland sites not yet surveyed for them.

Management Plan

None.

Northern Bog Lemming Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Outdated survey Poorly understood distribution of the species in Montana		Conservation and/or restoration of unoccupied potential habitat Consider including species in other comprehensive taxonomic plans Monitor known sites routinely to determine population persistence and trends Non-invasive capture techniques, such as scat genetic analysis, should be explored Target species for survey and inventory
Bogs/fens are threatened by poor range management practices, invasion of heavily grazed fens by exotic plants, and potential changes in the water regimes feeding the bogs/fens	Bogs/fens are threatened by poor range management practices, invasion of heavily grazed fens by exotic plants, and potential changes in the water regimes feeding the bogs/fens	Work with landowners and land management agencies to closely manage forest activities that may be detrimental to this species

Current Impacts	Future Threats	Conservation Actions
Conversion of forests to meadows by clearcutting, wildfire, or excessive thinning can increase populations of meadow voles and other species that compete with northern bog lemmings	Conversion of forests to meadows by clearcutting, wildfire, or excessive thinning can increase populations of meadow voles and other species that compete with northern bog lemmings	Maintain a buffer zone of 300 feet surrounding sphagnum or other fen moss mats or wetland areas that could provide corridors for dispersal to adjacent patches of suitable habitat
Human disturbances (timber harvesting and roads) are directly related to the decreased diversity of vascular plants, many of which are important to the diet of northern bog lemmings	Human disturbances (timber harvesting and roads) are directly related to the decreased diversity of vascular plants, many of which are important to the diet of northern bog lemmings	Work with landowners and land management agencies to limit activities that may be detrimental this species
	Climate change	Continue to evaluate current climate science models and recommended actions Monitor habitat changes and address climate impacts through adaptive management as necessary Routine monitoring of known populations

Additional Citations

Adelman, E. B. 1979. A survey of the nongame mammals in the Upper Rattlesnake Creek drainage of western Montana. MS thesis, University of Montana, Missoula Montana. 129 pp.

Chadde, S. W., J. S. Shelly, R. J. Bursik, R. K. Moseley, A. G. Evenden, M. Mantas, F. Rabe, and B. Heidel. 1998. Peatlands on national forests of the Northern Rockies.

Clough, G. C., and J. J. Albright. 1987. Occurrence of the northern bog lemming (*Synaptomys borealis*) in the northeastern United States. Canadian Field-Naturalist 101:611–613.

Foresman, K. R. 2012. Mammals of Montana. Mountain Press Publishing Company. Missoula, Montana.

Pearson, D. E. 1999. Small mammals of the Bitterroot National Forest: a literature review and annotated bibliography. General Technical Report RRS-GTR-25. Ogden, Utah: U.S.D.A. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 63 pp.

Reichel, J. D., and S. G. Beckstrom. 1994. Northern bog lemming survey: 1993. Unpublished report. Montana Natural Heritage Program. Helena, Montana. 87 pp.

Reichel, J. D., and J. G. Corn. 1997. Northern bog lemmings: survey, population parameters, and population analysis. Unpublished report to the Kootenai National Forest. Montana Natural Heritage Program, Helena, Montana. 27 pp.

Streubel, D. 2000. *Synaptomys borealis* (Northern Bog Lemming). Idaho Museum of Natural History. Idaho State Univ., Pocatello, Idaho. Website accessed at: http://imnh.isu.edu/digitalatlas/bio/mammal/Rod/Mice/nble/nble.htm

West, S. D. 1999. Northern bog lemming (*Synaptomys borealis*). Pp. 655–656 in the Smithsonian book of North American mammals, D. E. Wilson and S. Ruff, eds. Smithsonian Institution Press, Washington, DC.

Wright, P. L. 1950. *Synaptomys borealis* from Glacier National Park, Montana. Journal of Mammalogy 31(4):460.

Northern Short-tailed Shrew (*Blarina brevicauda*)

State Rank: S1S3
Global Rank: G5

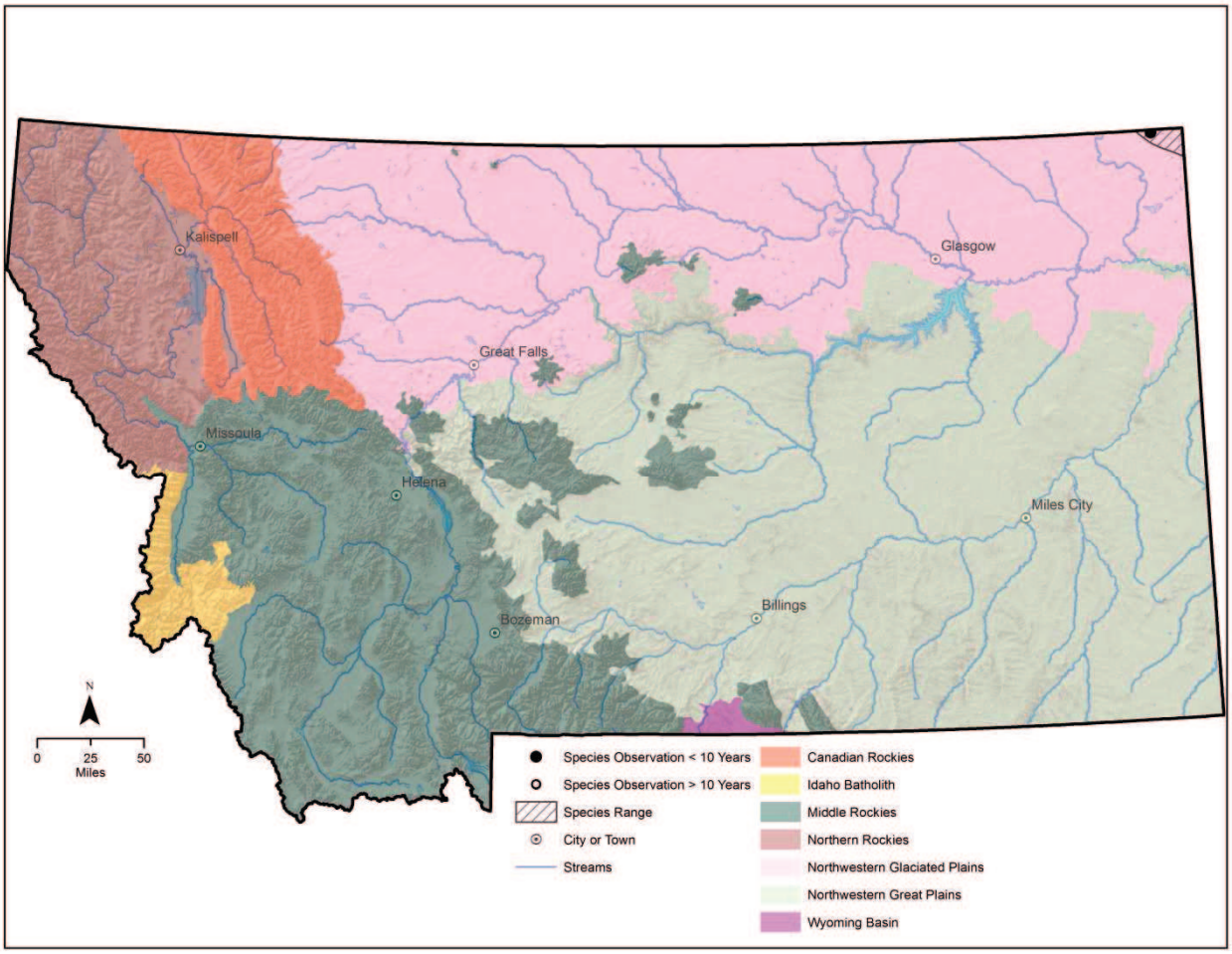

Figure 62. Montana range and observations of the northern short-tailed shrew

Habitat

Considered hypothetical in extreme northeastern Montana since at least 1968 (Hoffmann and Pattie 1968) until 2 captured in August 2005 in Sheridan County in marshy, prairie pothole habitat about 1.35 miles south of the Saskatchewan border. Farther east, within the main range of the species, northern short-tailed shrews are most common in hardwood forests with deep leaf litter and in brushy sites adjacent to ponds and streams, less common in conifer forest and grassland. In Manitoba this shrew is reported to be most common in grass-sedge marsh and willow-alder shrubs (Jones et al. 1983, van Zyll de Jong 1983, George et al. 1986). Northern short-tailed shrews seem to prefer wet areas, likely because the soil is loose for burrowing and there is a greater amount of prey (Foresman 2012).

Management

No management needs have been identified and no measures have been enacted to promote northern short-tailed shrew conservation in Montana. Wetland drainage or alteration, and loss of riparian vegetation (e.g. aspen, birch, willow, cottonwood) in woody draws and around springs or seeps, has the potential to negatively impact local populations. Additional surveys for northern

short-tailed shrew can provide the basis for development of conservation protocols by determining its full distribution in Montana, the array of habitats in which it occurs, its relative abundance in different habitats, and, if properly designed, an idea of how different habitat disturbances affect this shrew at the margin of its global range.

Management Plan
None.

Northern Short-tailed Shrew Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Data poor		Target species for survey and inventory
Conversion of native habitat to cropland agriculture	Conversion of native habitat to cropland agriculture	Protect habitat that is at highest risk of conversion to cropland through the possible use of easements acquisition Work with landowners and land management agencies to limit activities that may be detrimental to this species
Oil and gas development	Oil and gas development	Follow recommendations in FWP's *Fish and Wildlife Recommendations for Oil and Gas Development in Montana* (FWP In prep)
Wetland degradation or loss	Wetland degradation or loss	Work with landowners and land management agencies to limit activities that may be detrimental to this species

Additional Citations

Foresman, K. R. 2012. Mammals of Montana. Mountain Press Publishing Company. Missoula, Montana.

George, S. B., J. R. Choate and H. H. Genoways. 1986. *Blarina brevicauda*. American Society of Mammalogists, Lawrence, Kansas. Mammalian Species No. 261:1-8.

Hoffmann, R. S. and D. L. Pattie. 1968. A guide to Montana mammals: identification, habitat, distribution, and abundance. University of Montana, Missoula.

Jones, J. K. Jr., D. M. Armstrong, R. S. Hoffmann and C. Jones. 1983. Mammals of the northern Great Plains. University of Nebraska Press, Lincoln.

Montana Fish, Wildlife & Parks. In prep. Fish and Wildlife Recommendations for Oil and Gas Development in Montana.

van Zyll de Jong, C.G. 1983. Handbook of Canadian mammals. 1. Marsupials and insectivores. National Museum of Natural Sciences, National Museums of Canada, Ottawa, Canada.

White-tailed Prairie Dog (*Cynomys leucurus*) State Rank: S1
Global Rank: G4

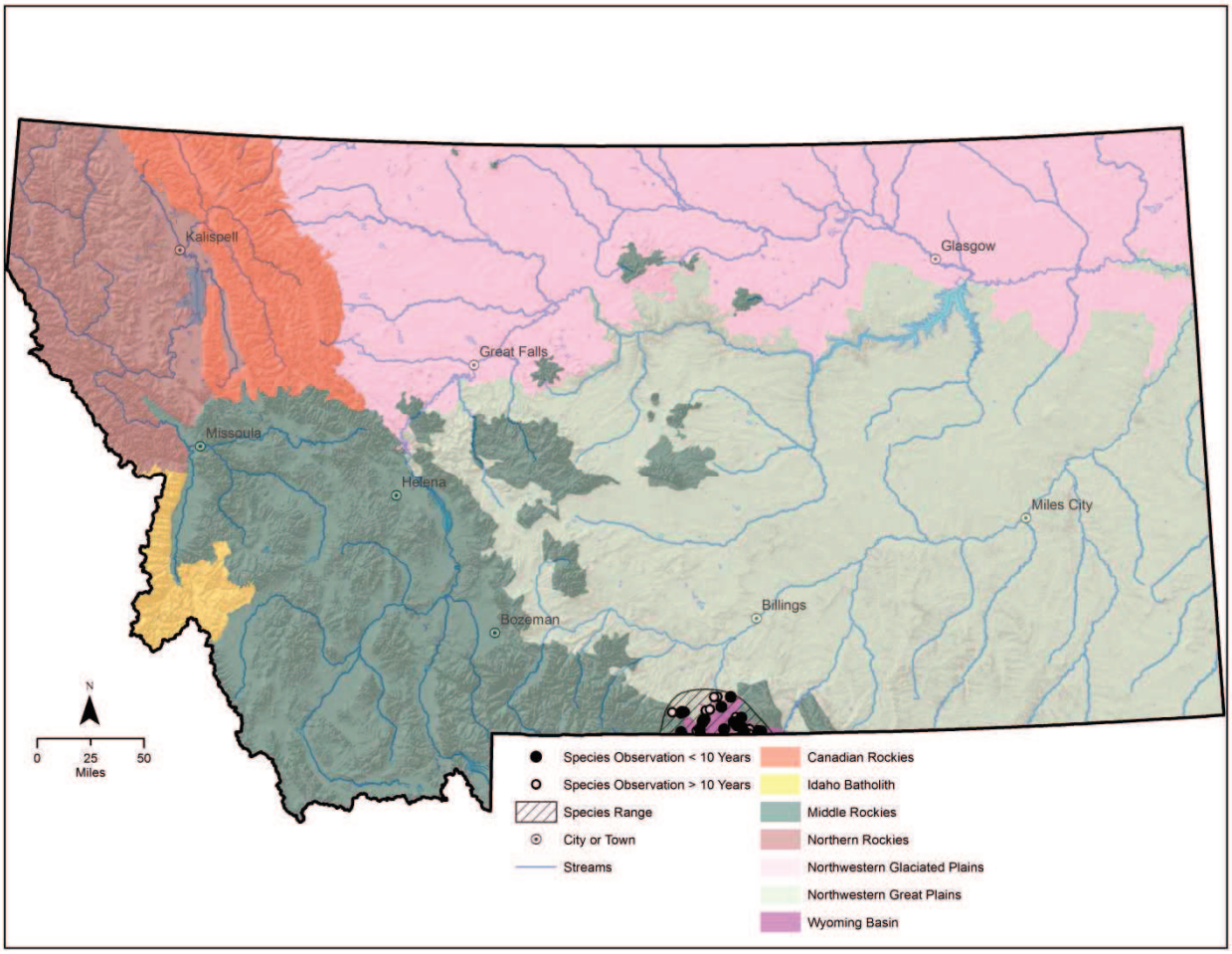

Figure 63. Montana range and observations of the white-tailed prairie dog

Habitat

Throughout their range, WTPDs inhabit xeric sites with mixed stands of shrubs and grasses. In Montana they inhabit sites dominated by Nuttall saltbrush with lesser amounts of big sage and areas with povery sumpweed (Flath 1979; Foresman 2012). They live at higher elevations and in meadows with more diverse grass and herb cover than do black-tailed prairie dogs (Hoffmann, in Wilson and Ruff 1999), and their range in Montana is at higher elevations than other sites within their distribution.

Management

Prairie dogs in Montana are currently an unregulated nongame species. Shooting of prairie dogs on public lands is allowed unless covered under a specific area closure, e.g., UL Bend on the Charles M. Russell National Wildlife Refuge. WTPDs are managed under the Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group 2002). WTPDs were found to be not warranted for listing under the ESA in May, 2010. Threats to the species however remain throughout its range to include habitat conversion and loss.

Translocation of WTPD in south central Montana was intended to re-establish the species at colonies from which they had been extirpated and to provide prey and habitat for a variety of other wildlife. Translocation was also intended to ensure maintenance of a viable population of WTPD in Montana. FWP translocated 44 WTPD within Carbon County with these intentions in mind and to remove individuals at colonies under threat from highway re-alignment. WTPD conservation in Montana also benefitted from FWP's leadership of the Montana Prairie Dog Working Group as well as involvement with WAFWA's efforts to conserve prairie dogs.

Management Plans

Bureau of Land Management. 1979. Habitat management plan for prairie dog ecotypes. BLM, Montana State Office. Wildlife Habitat Area MT-02-06-07-S1. 61 pp.

Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana. Montana Prairie Dog Working Group 2002.

White-tailed Prairie Dog Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Conversion of native rangelands to agriculture, and, to a lesser degree, residential development	Conversion of native rangelands to agriculture, and, to a lesser degree, residential development	Continue to develop, refine, and implement financial incentives for landowners to maintain prairie dogs Support strategic conservation easements by conservation organizations and public agencies to enhance critical habitat Work with landowners and land management agencies to limit activities that may be detrimental to this species
Disease, particularly sylvatic plague (*Yersinia pestis*)	Disease, particularly sylvatic plague (*Yersinia pestis*)	Assist in funding research projects targeting effects of disease on prairie ecosystems Continue to support plague vaccine testing and implement as recommended if found to be a valuable tool
Poor grazing practices	Poor grazing practices	Support livestock grazing management that maintains or improves native rangeland integrity Support research evaluating livestock grazing systems that enhance WTPD habitat features and ultimately WTPD populations

Current Impacts	Future Threats	Conservation Actions
	Climate change	Continue to evaluate current climate science models and recommended actions Monitor habitat changes and address climate impacts through adaptive management as necessary Reintroduce WTPD to sites that were formerly occupied until the early 1990s Secure WTPD over a larger portion of their historic range to increase likelihood of persistence in a changing environment

Additional Citations

Flath, D. L. 1979. Status of the white-tailed prairie dog in Montana. Proceedings of the Montana Academy of Sciences 38:63–67.

Foresman, K. R. 2012. Mammals of Montana. Mountain Press Publishing Company. Missoula, Montana.

Montana Prairie Dog Working Group. 2002. Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana. Montana Fish, Wildlife and Parks. Helena Montana. 51 pp.

Wilson, D. E., and S. Ruff. 1999. The Smithsonian book of North American mammals. Smithsonian Institution, Washington, DC.